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WE CLAIM:

1. A downhole pipe repair apparatus, comprising:
 - a surface treatment apparatus adapted for cleaning an interior surface of said pipe;
 - a plating apparatus adapted for plating a new surface on the interior surface of said pipe after said surface treatment apparatus cleans said interior surface of said pipe; and
 - a corrosion monitoring tool adapted for examining said interior surface of said pipe after said plating apparatus plates said new surface on said interior surface of said pipe.
2. The downhole pipe repair apparatus of claim 2, further comprising:
 - a sealing apparatus disposed between the corrosion monitoring tool and said surface treatment apparatus adapted for sealing off said surface treatment apparatus from said corrosion monitoring tool inside said pipe.
3. The downhole pipe repair apparatus of claim 3, further comprising:
 - a sealing apparatus disposed between the surface treatment apparatus and the plating apparatus adapted for sealing off said plating apparatus from said surface treatment apparatus inside said pipe.

4. A method for downhole pipe repair, said method comprising:
 - (a) cleaning an interior of said pipe;
 - (b) plating a new surface on the interior of said pipe after the cleaning step; and
 - (c) examining, by a corrosion monitoring tool, said interior of said pipe after plating said new surface on said interior of said pipe.
5. The method of claim 4, wherein the cleaning step (a) further comprises:
 - (a1) examining, by said corrosion monitoring tool, said interior of said pipe; and
 - (a2) cleaning said interior of said pipe after the examining step (a1).
6. The method of claim 4, wherein the plating step (b) comprises an electrolytic plating step.
7. The method of claim 4, wherein the plating step (b) comprises a chemical plating step.
8. The method of claim 4, wherein the cleaning step (a) comprises blasting a material against said interior of said pipe thereby generating removed corroded areas, and collecting removed corroded areas in a container.
9. The method of claim 5, wherein the examining steps (c) and (a1) each further comprise: pressing one or more fingers against said interior of said pipe, passing said fingers over said interior of said pipe, flexing said fingers when a corroded area is encountered on said interior, and generating an electrical signal in response to the flexing step representative of said corroded area..

10. The method of claim 5, wherein the examining steps (c) and (a1) each further comprise: propagating a compressional or shear wave through one or more corroded areas on said interior of said pipe, receiving the compressional or shear waves from the interior of said pipe, and generating a record of the received compressional or shear waves representative of said corroded areas.